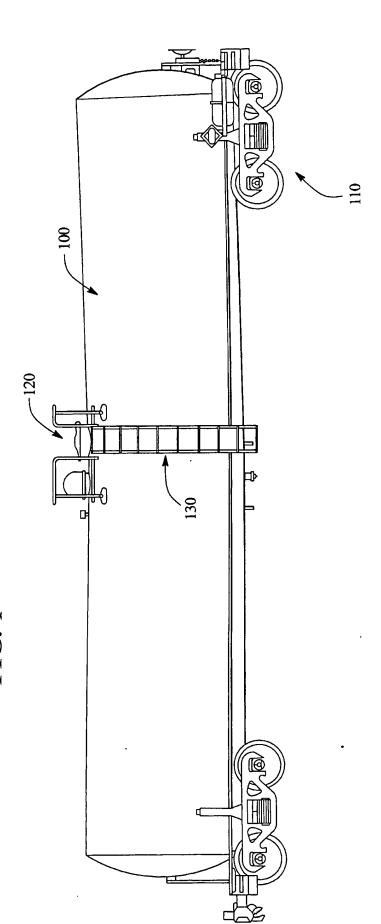
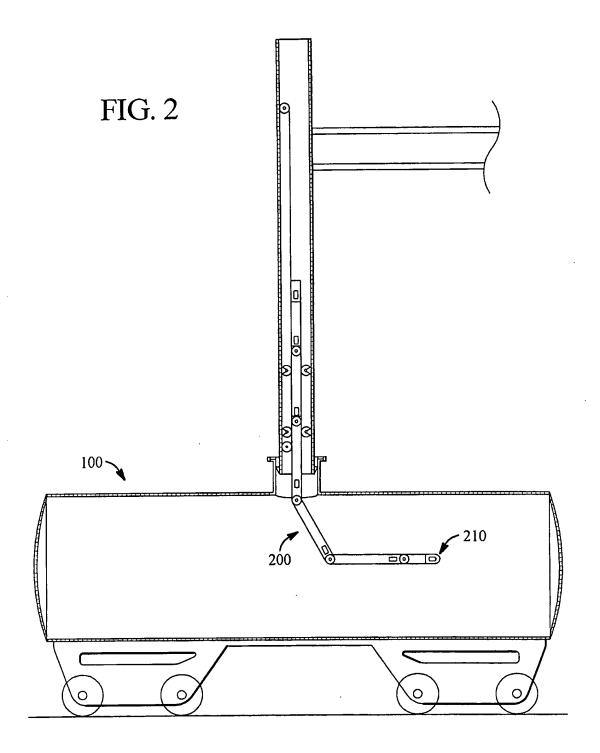


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U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372,2000 Fax: 312.984.7700
Docket No. 47440-015 (p.k.a. 47440-027)



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U.S. Patent Application No. 09/672,793
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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Patent Agent: Patrick D. Richards (Reg. No. 48,905) Tel: 312.372.2000 Fax: 312.984.7700 Docket No. 47440-015 (p.k.a. 47440-027) Sheet 3 of 85 HM-201 2014 Visually inspect the thermal protection Inspection Procedure systems, tank head puncture resistance systems, coupler vertical Visual inspection of tank 2001 restraint systems and systems used to shell interior and exterior protect discontinuities to ensure their integrity Visual inspection of piping, 2002 valves, fittings and gaskets 2015 Remove the safety relief device FIG. 3 from the tank car and Visual inspection of brake visually inspect for damage rigging, safety appliances, draft system, valves and fittings 2003 Test the safety relief device Visual inspection of all with air to ensure that it 2016 2004 closures and protective conforms to the start-todischarge pressure for the housing on the Tank Car specification of hazardous material Visual inspection of all the 2005 required markings on the Tank Car 2017 Visual 2006 -Does the car inspection Does the car No have a lining for the of excess have an excess protection of the Yes flow flow valve? tank shell? 2008 2019 valve No Yes Enhanced visual inspection 2018 2007 Obtain of all fillet welds greater than Is lining 1/4" within 4 feet of the bottom the lining No inspection longitudinal centerline 2010 owned procedure by GE? from 2009 Manual Ultrasonic customer Does 2021 Flaw detection on No the Yes all circumferential 2020 car have interior butt-welds of the Perform lining heater inspection using tank shell two feet 2012 coils? Perform of the bottom GE approved lining Yes longitudinal procedure inspection centerline Automated Ultrasonic procedure 2022 Flaw detection on all according circumferential buttto Perform welds of the tank shelf customer hydrostatic coil Perform leakage requirements two feet of the bottom test pressure test longitudinal centerline 2013 Ultrasonic thickness examination of 2011 Place car into -2023 the tank shell, heads, sumps, manways, repair process and nozzles for each compartment

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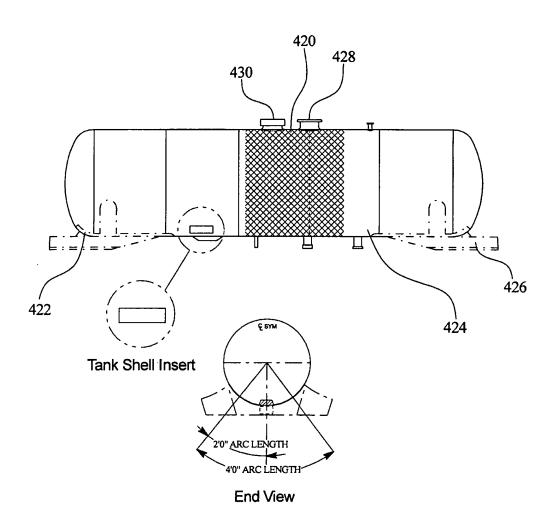
Title: Method and Arrangement for Inspection and Requalification of...

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Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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Docket No. 47440-015 (p.k.a. 47440-027)

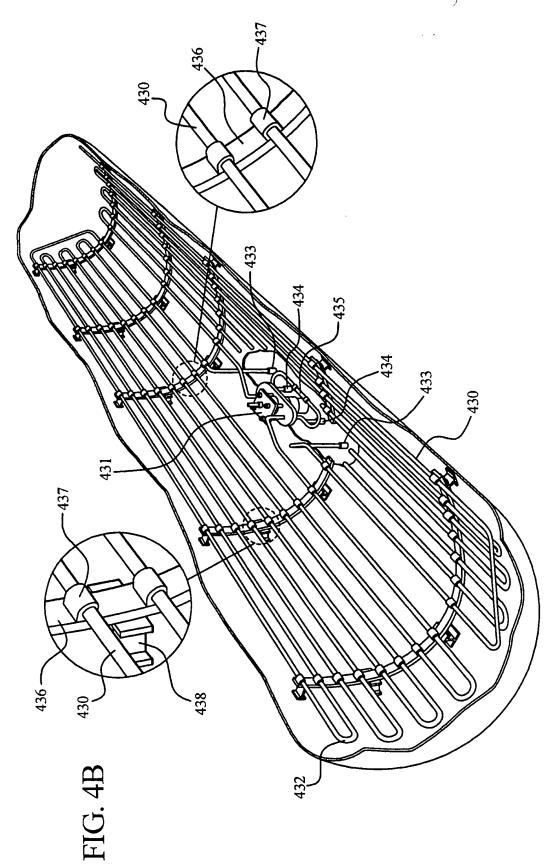
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### FIG. 4A



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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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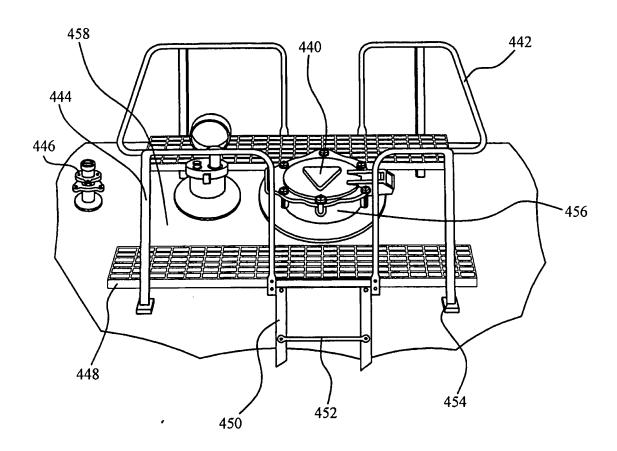
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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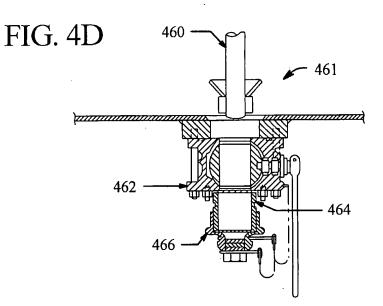
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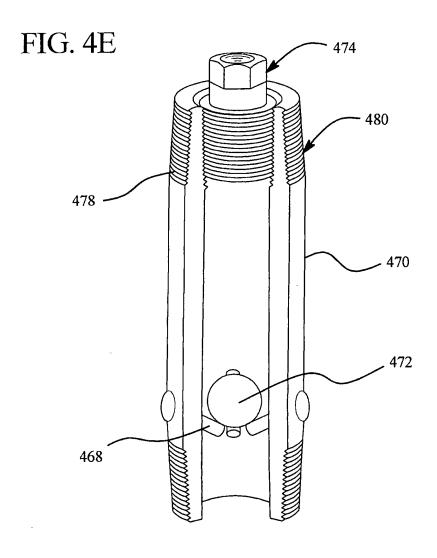
FIG. 4C



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FIG. 4F

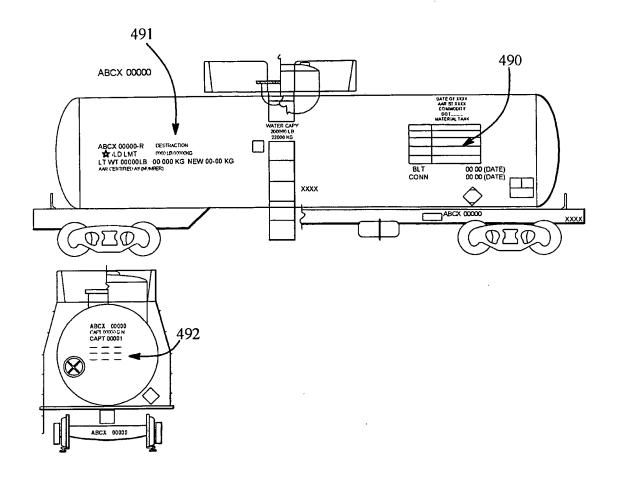


FIG. 4G

|          | <u> </u>           |      | ——— 41 3/4" ——  |           | <b>&gt;</b> |
|----------|--------------------|------|-----------------|-----------|-------------|
| <b>^</b> |                    |      | STATION STENCIL | QUALIFIED | DUE         |
| 17 1/4"  | TANK QUALIFICATION |      |                 |           |             |
|          | SERVICE EQUIPMENT  |      |                 |           |             |
|          | (1a)               | (1b) |                 |           |             |
|          | (2a)               | (2b) |                 |           |             |
|          | COATING/LINING     |      |                 |           |             |
|          | TYPE               | (3a) |                 |           |             |
|          | DATE APPLIED       | (3b) |                 |           |             |
|          | 88.B.2.INSPECTION  |      |                 |           |             |

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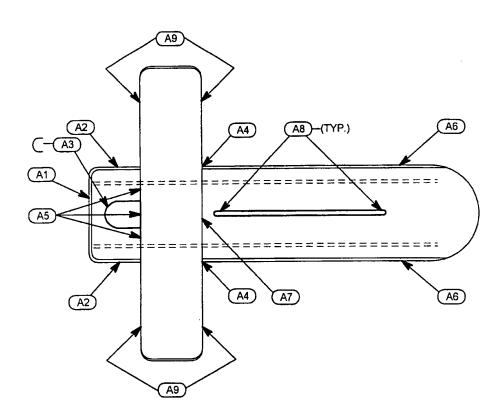
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

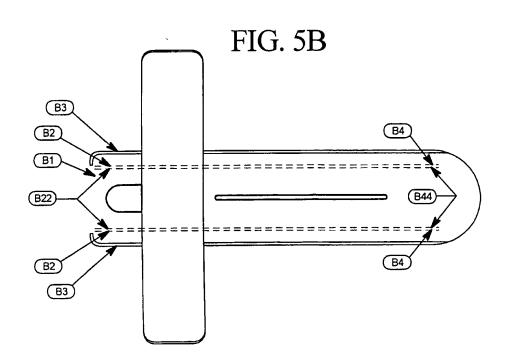
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FIG. 5A





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# FIG. 5C

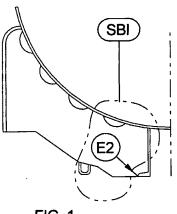


FIG. 1

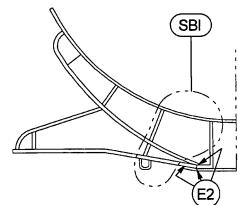
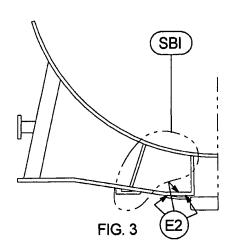
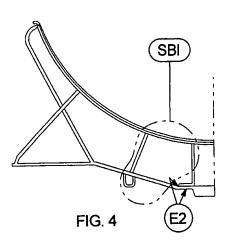
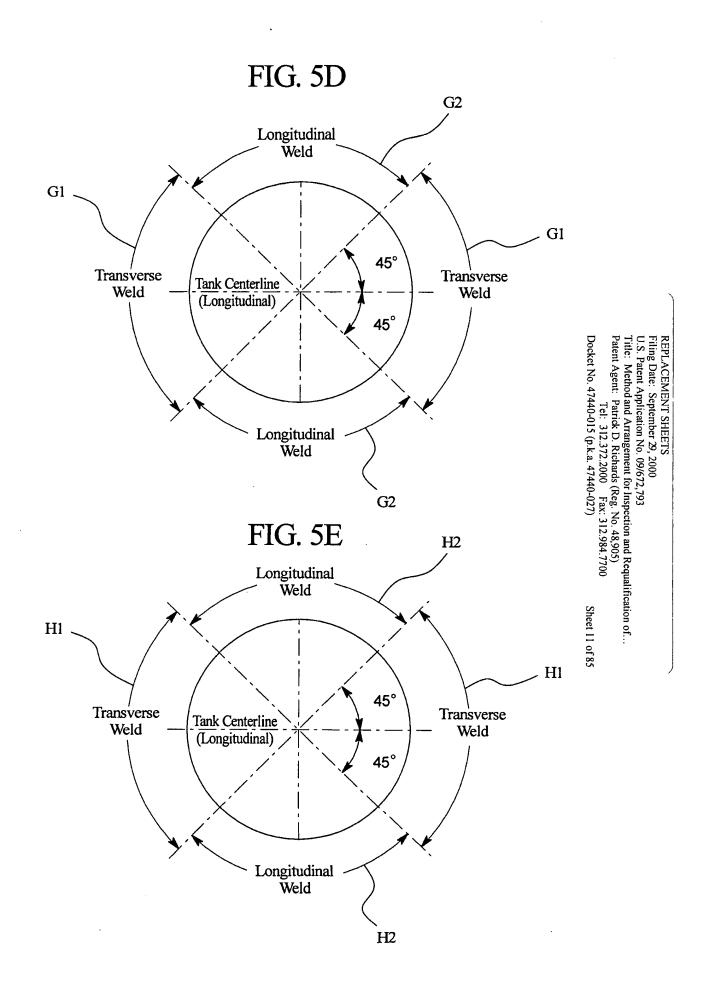


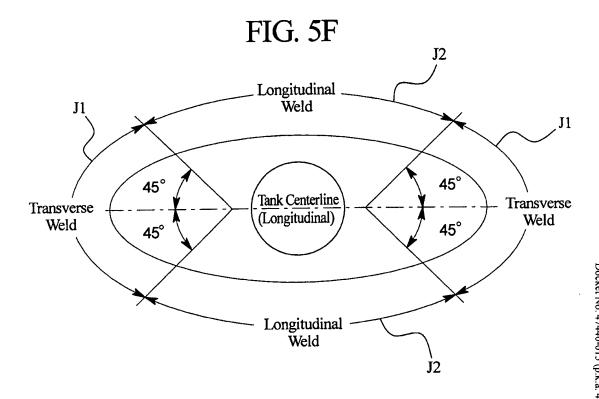
FIG. 2

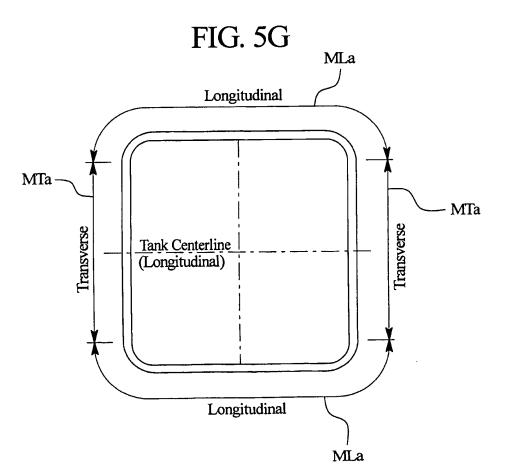




SBI FIG. 5







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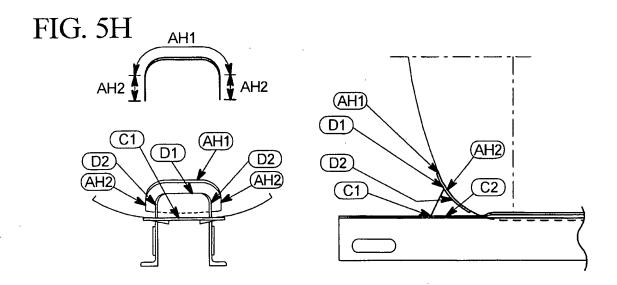
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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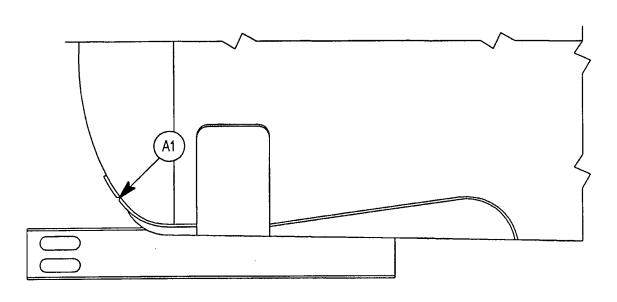
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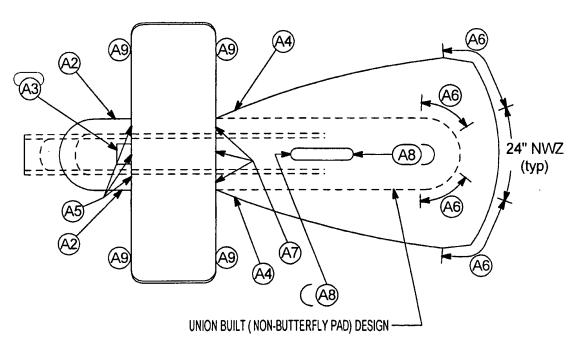


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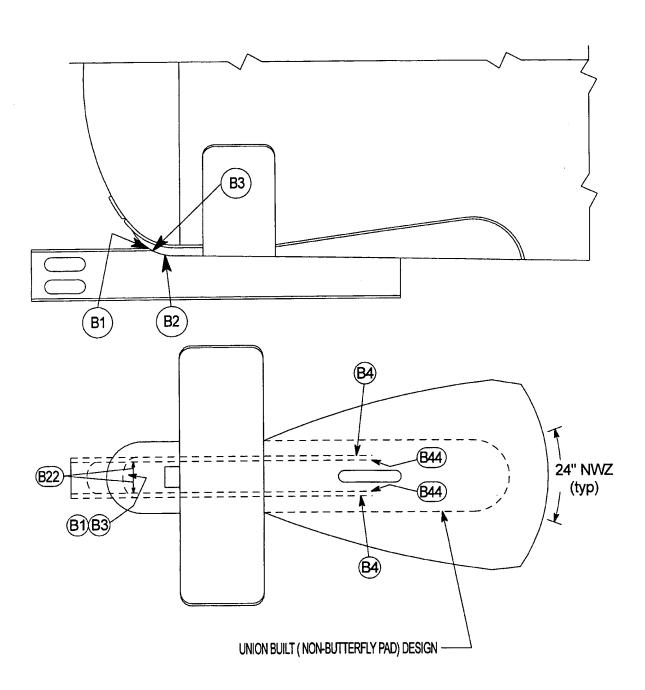
#### FIG. 6A





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FIG. 6B



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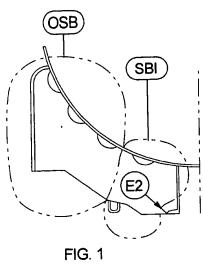
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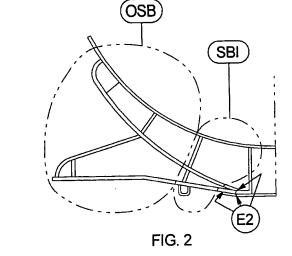
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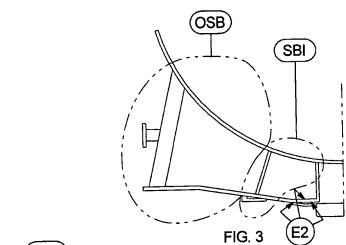
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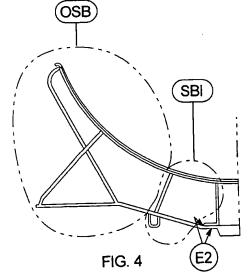
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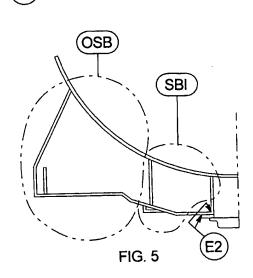
## FIG. 6C

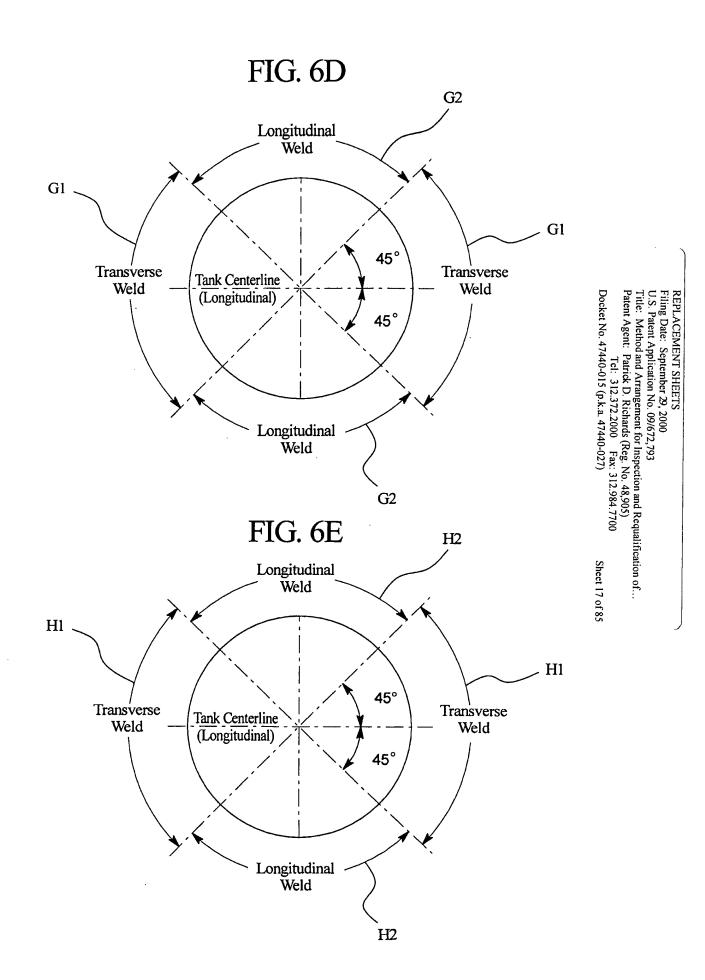












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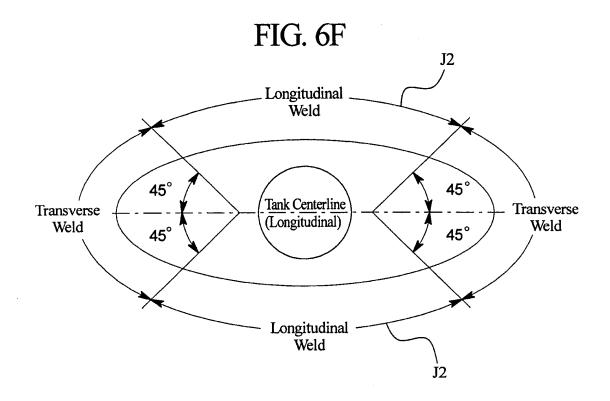
U.S. Patent Application No. 09/672,793

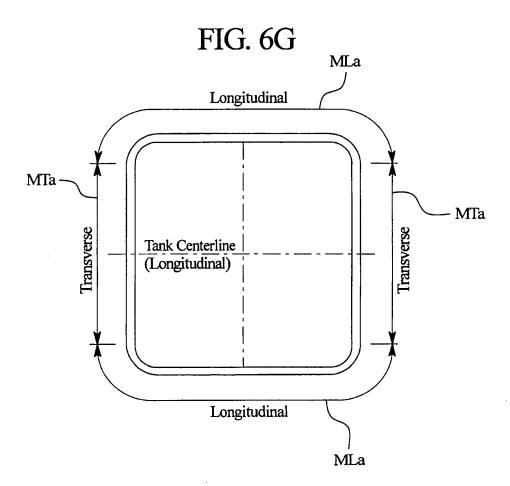
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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Title: Method and Arrangement for Inspection and Requalification of...

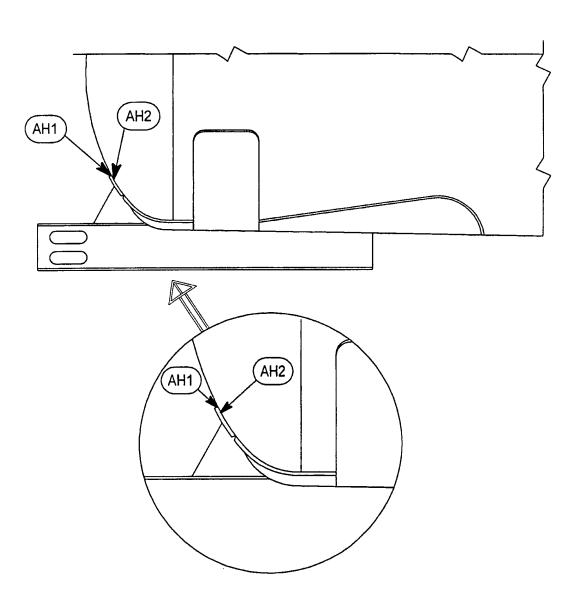
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

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FIG. 6H



Title: Method and Arrangement for Inspection and Requalification of...

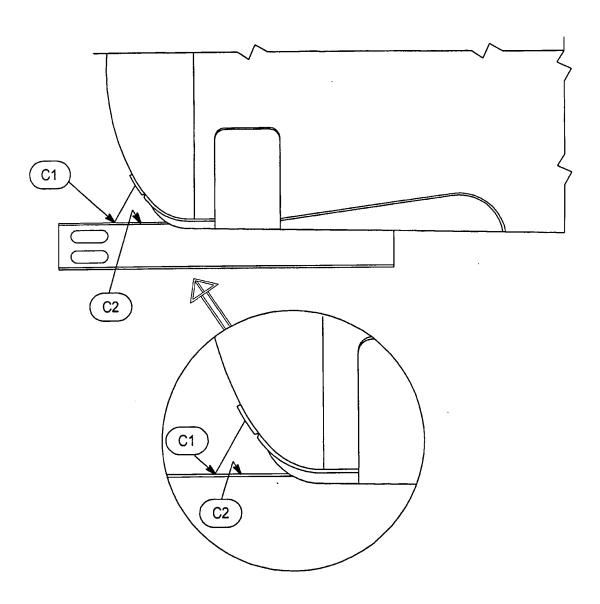
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

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FIG. 6I



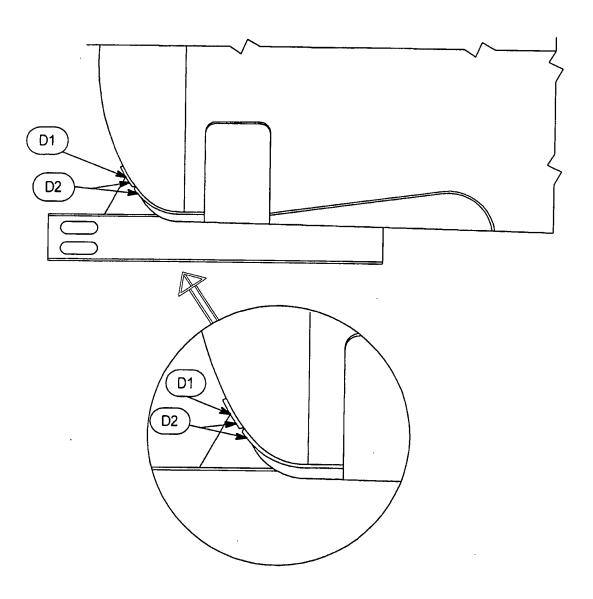
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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FIG. 6J



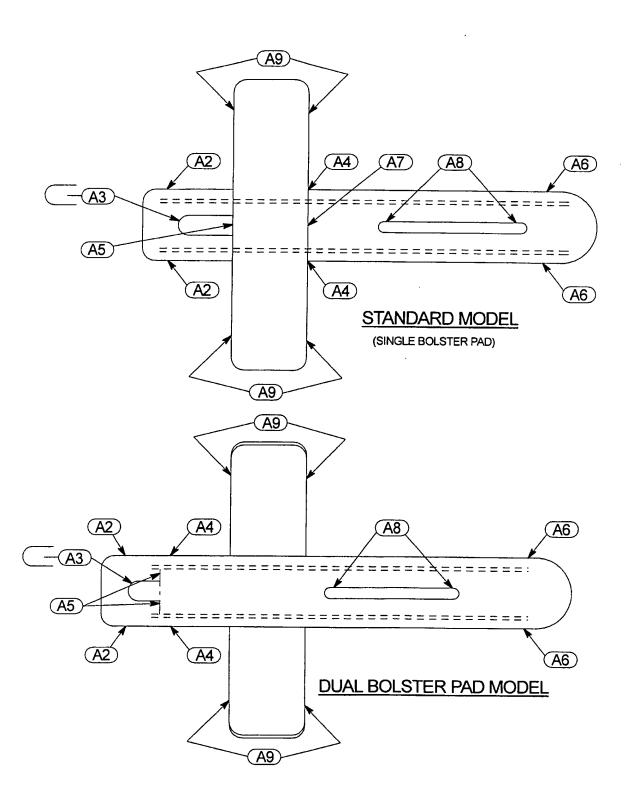
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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#### FIG. 7A



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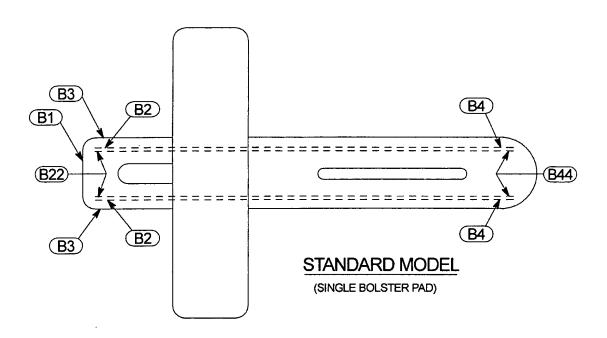
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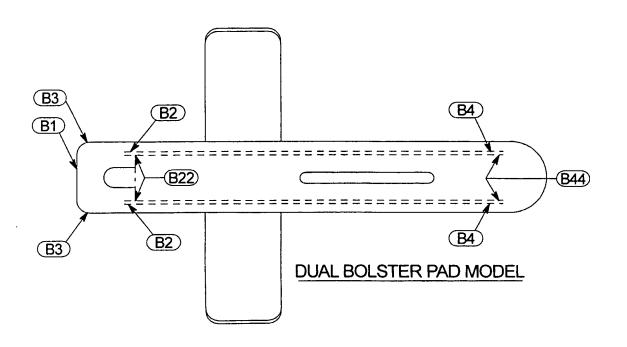
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 7B

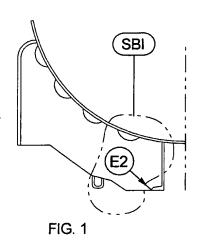




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Filing Date: September 29, 2000
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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# FIG. 7C



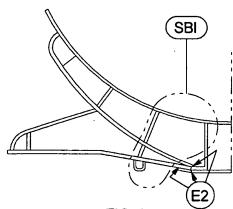
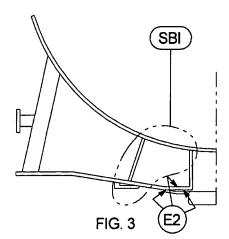
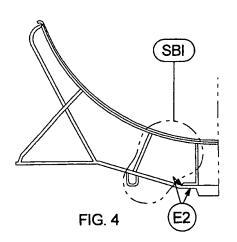
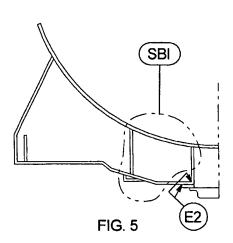


FIG. 2







### FIG. 7D

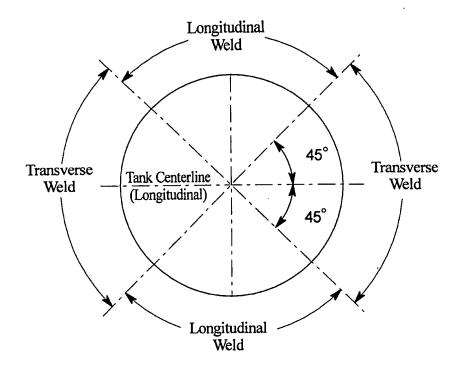
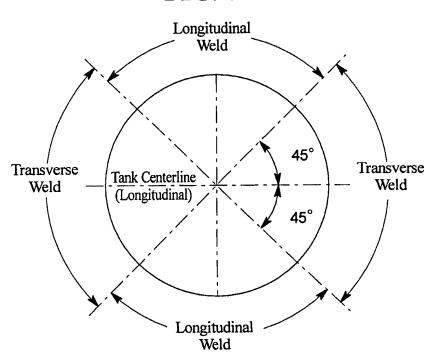


FIG. 7E



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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

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FIG. 7F

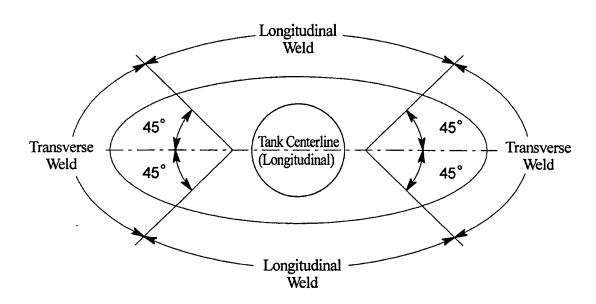
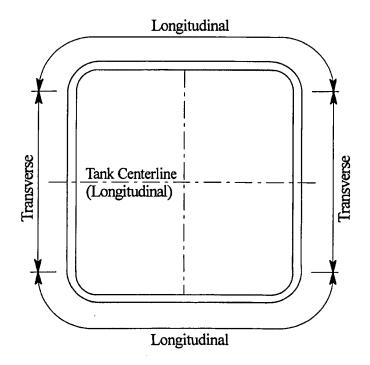


FIG. 7G



REPLACEMENT SHEETS

Filing Date: September 29, 2000 U.S. Patent Application No. 09/672,793

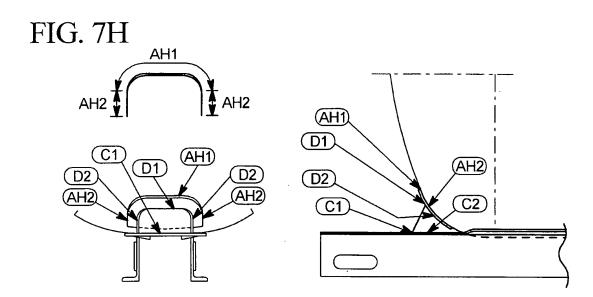
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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FIG. 8A

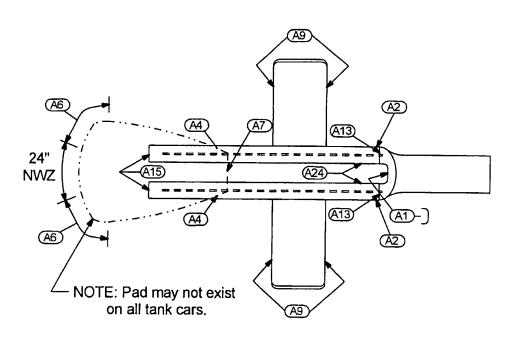
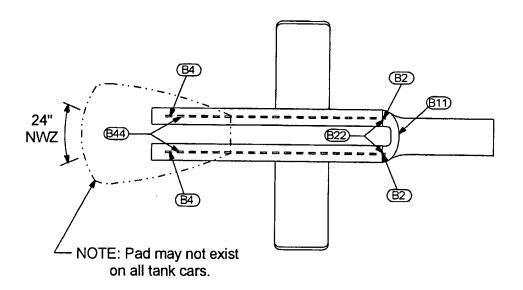


FIG. 8B

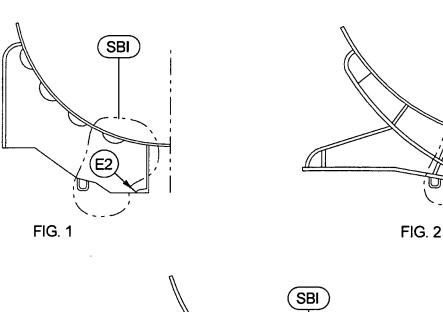


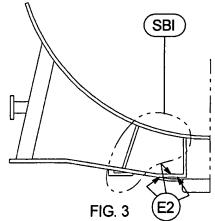
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U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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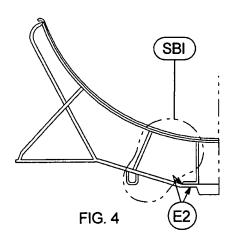
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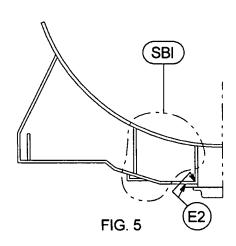
SBI

# FIG. 8C

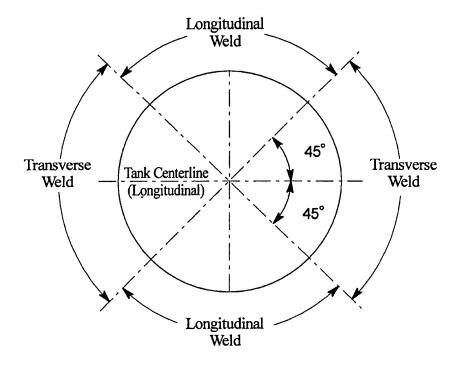




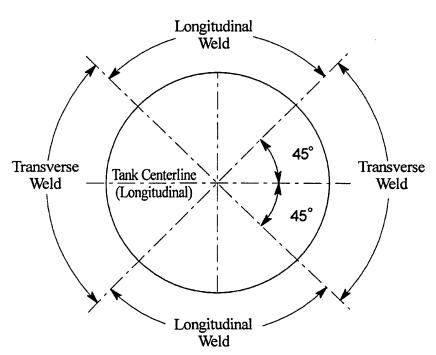




# FIG. 8D

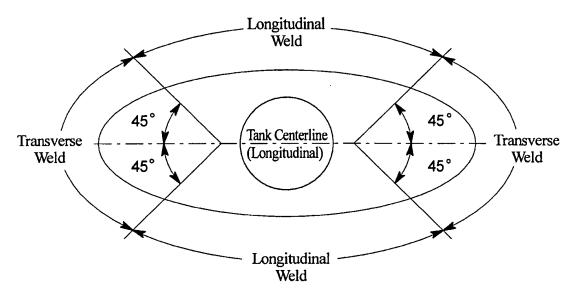


#### FIG. 8E

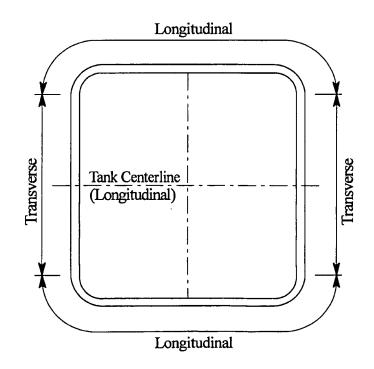


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Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312,372,2000 Fax: 312,984,7700
Docket No. 47440-015 (p.k.a. 47440-027)
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FIG. 8F



# FIG. 8G



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Patent Agent: 312,372,2000 Fax: 312,984,7700
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REPLACEMENT SHEETS

Filing Date: September 29, 2000

U.S. Patent Application No. 09/672,793

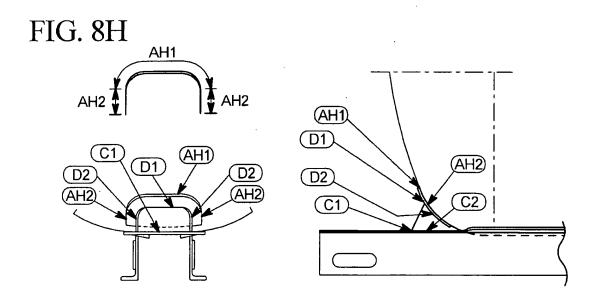
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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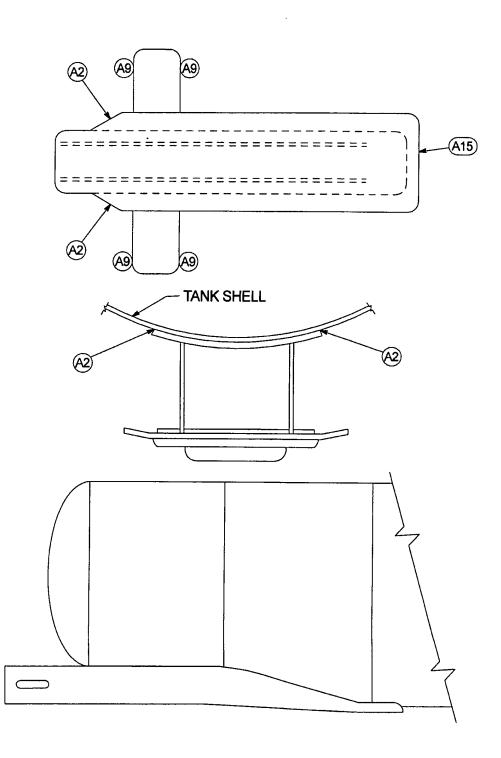
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U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

Docket No. 47440-015 (p.k.a. 47440-027)

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FIG. 9A



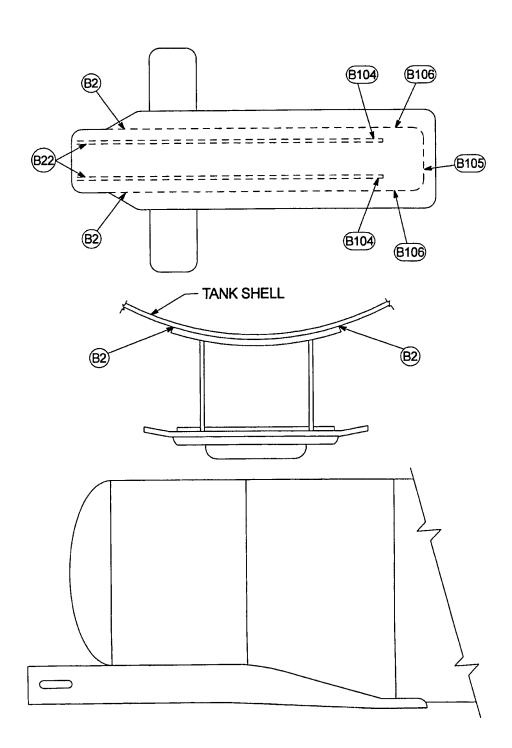
REPLACEMENT SHEETS Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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### FIG. 9B



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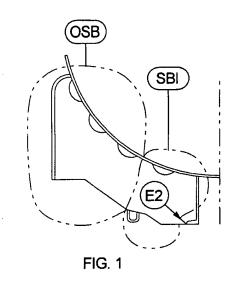
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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# FIG. 9C



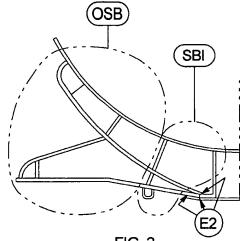
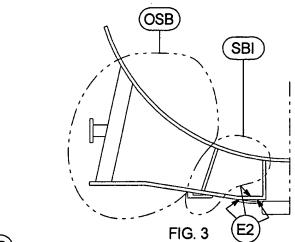


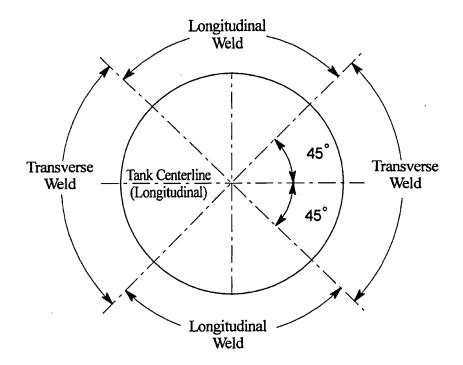
FIG. 2



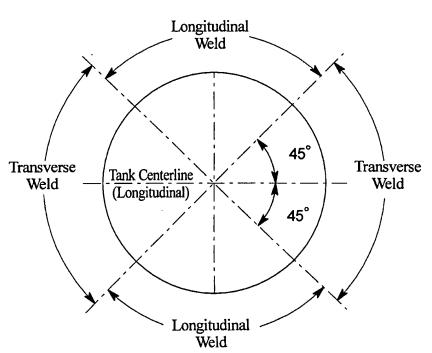
OSB SBI FIG. 4

OSB SBI FIG. 5

#### FIG. 9D



#### FIG. 9E



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FIG. 9F

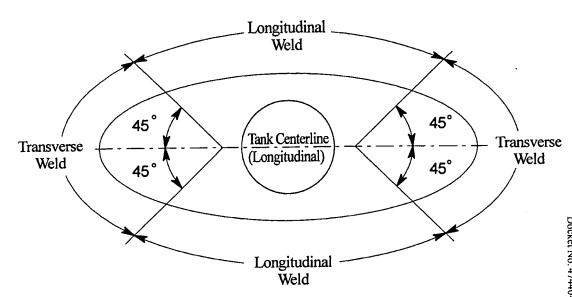
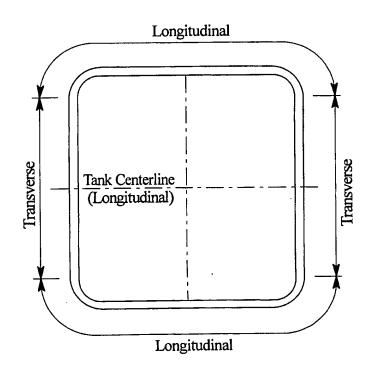


FIG. 9G



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Docket No. 47440-015 (p.k.a. 47440-027)
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U.S. Patent Application No. 09/672,793

Title: Method and Arrangement for Inspection and Requalification of...

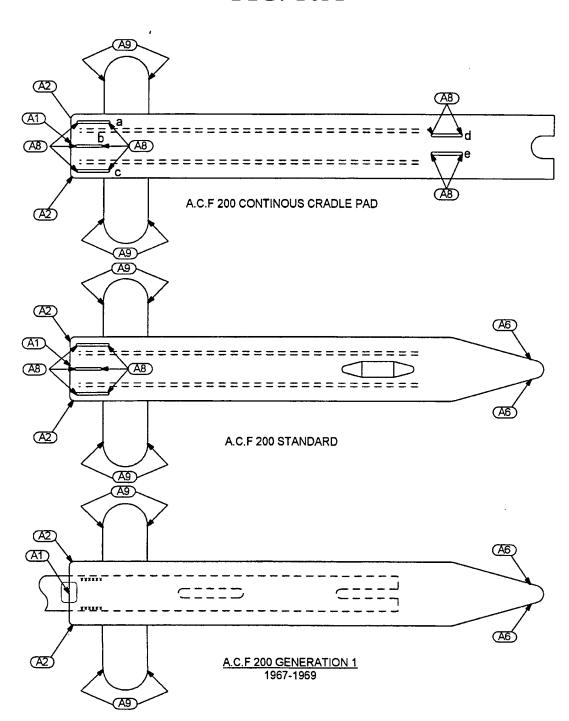
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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FIG. 10A

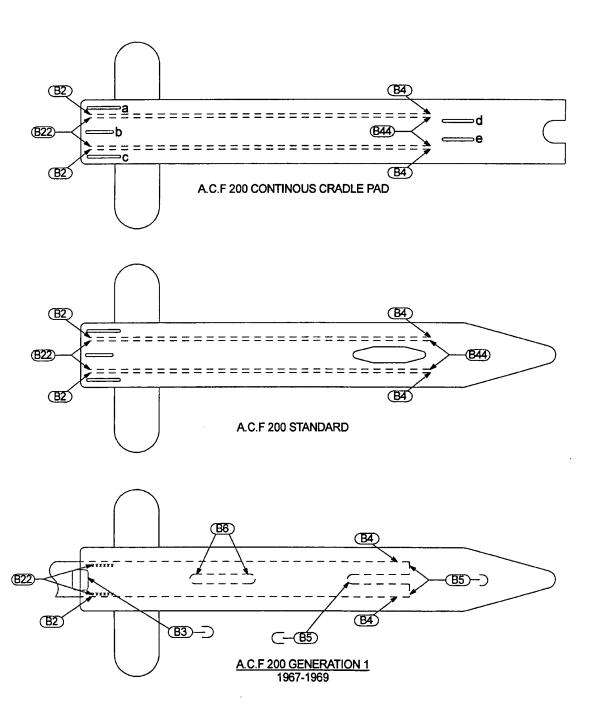


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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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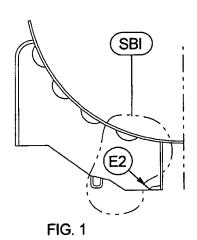
#### FIG. 10B

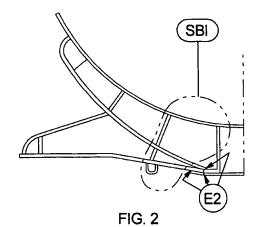


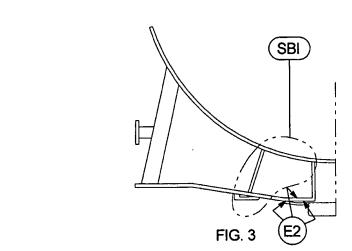
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Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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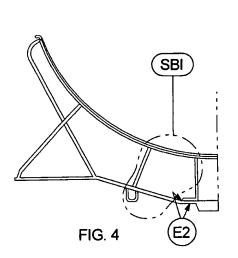
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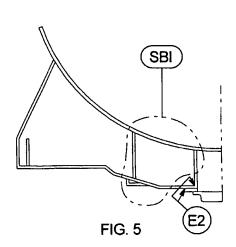
## FIG. 10C



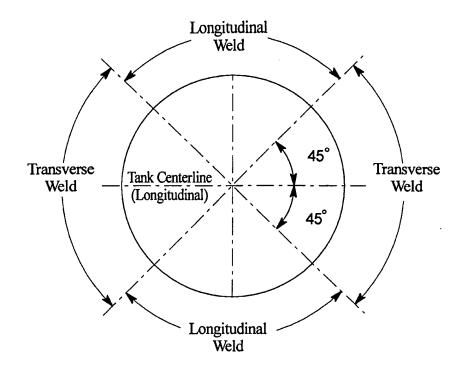




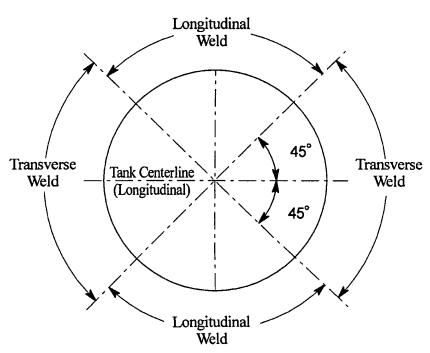




#### FIG. 10D



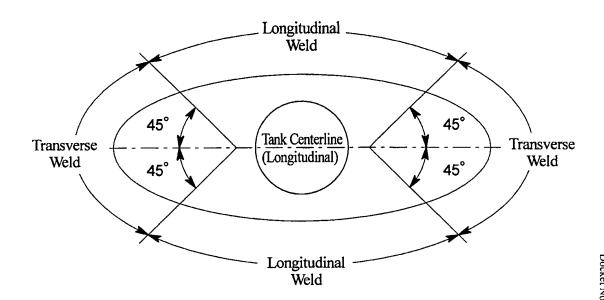
#### FIG. 10E



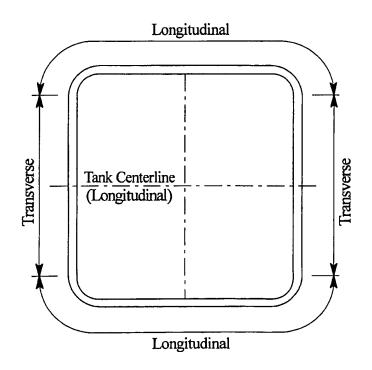
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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#### FIG. 10F

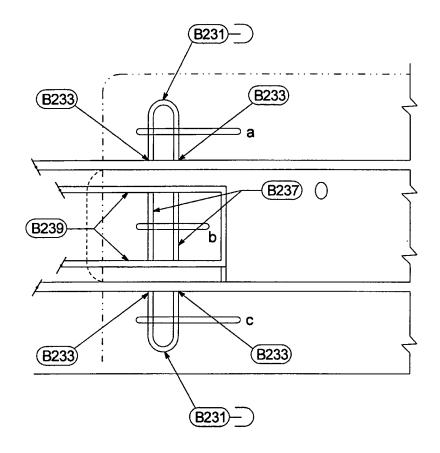


## FIG. 10G



U.S. Patent Application No. 09/672,793
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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# FIG. 10H



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Title: Method and Arrangement for Inspection and Requalification of ...
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Cradle Pad

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U.S. Patent Application No. 09/672,793

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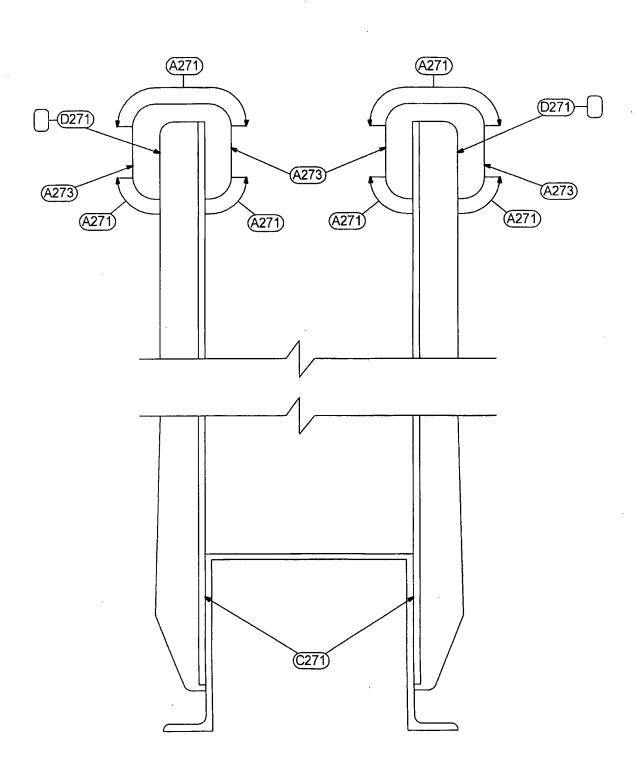
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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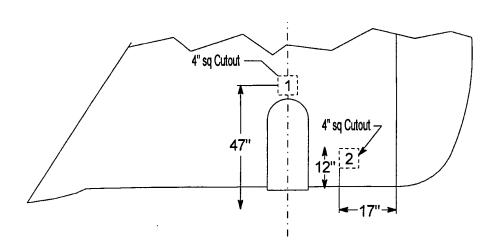
#### FIG. 10I

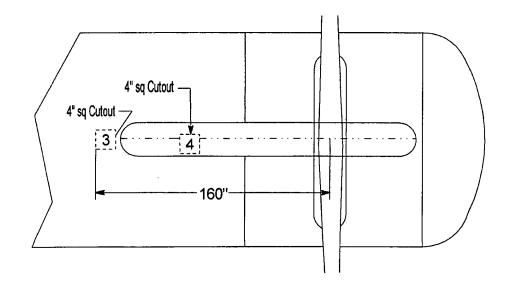


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Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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FIG. 10J





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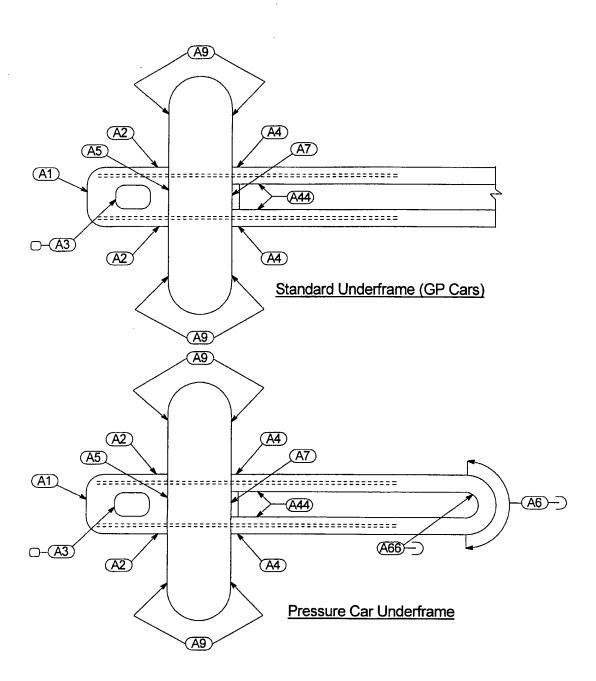
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

Docket No. 47440-015 (p.k.a. 47440-027)

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#### FIG. 11A



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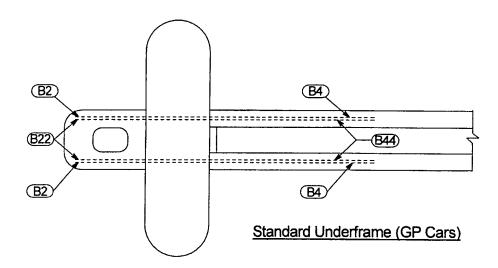
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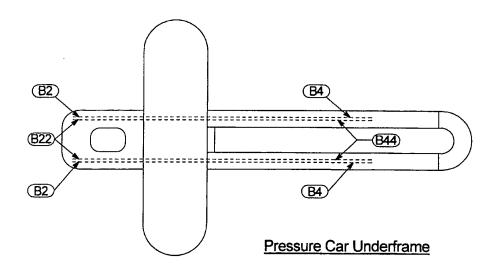
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 11B



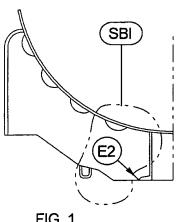


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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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# FIG. 11C





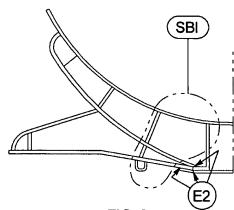
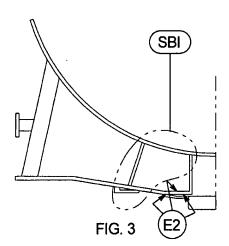
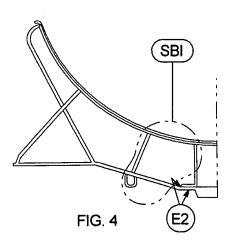


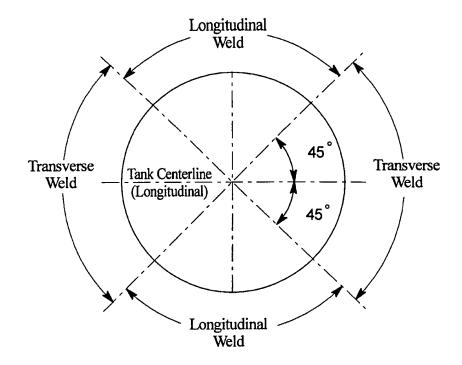
FIG. 2



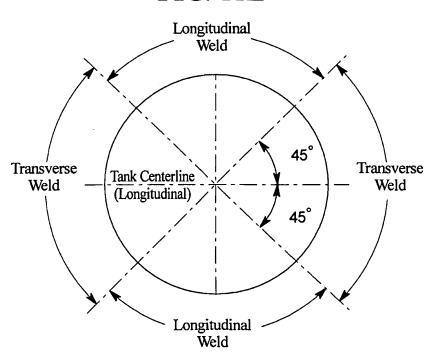


SBI FIG. 5

#### FIG. 11D



#### FIG. 11E



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Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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FIG. 11F

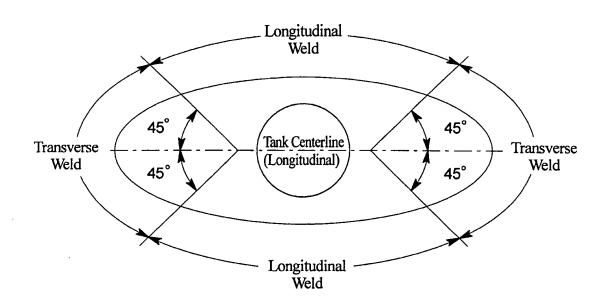
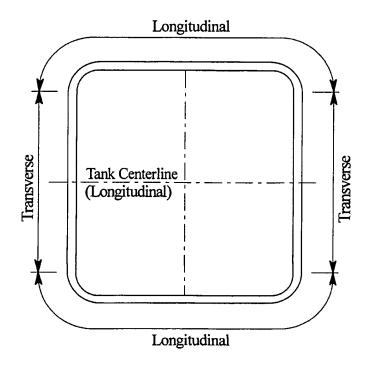


FIG. 11G



REPLACEMENT SHEETS

Filing Date: September 29, 2000 U.S. Patent Application No. 09/672,793

Title: Method and Arrangement for Inspection and Requalification of...

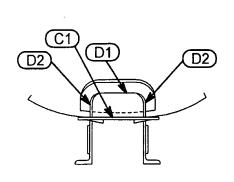
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

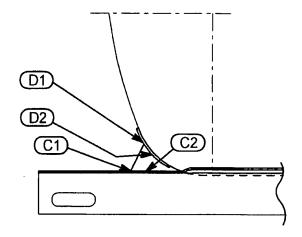
Tel: 312.372.2000 Fax: 312.984.7700

Docket No. 47440-015 (p.k.a. 47440-027) Sheet 51 of the state of

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#### FIG. 11H





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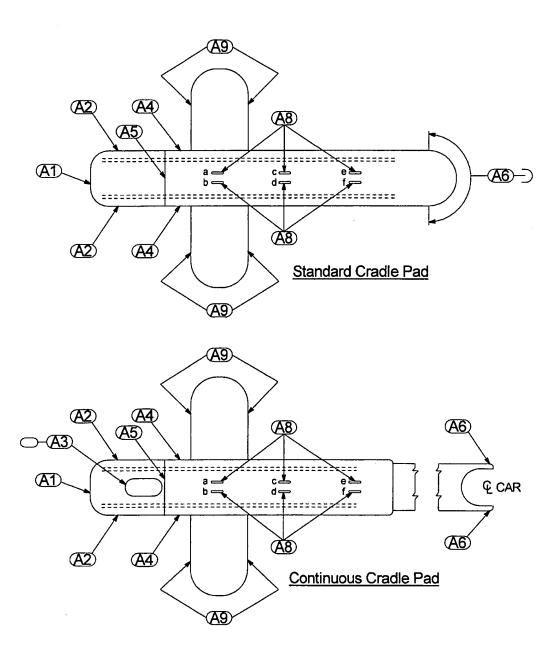
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 12A



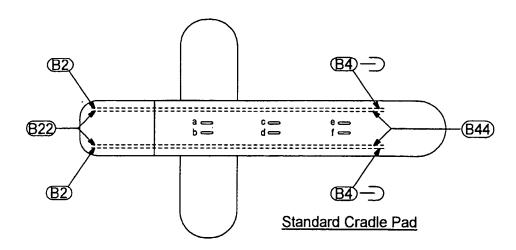
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U.S. Patent Application No. 09/672,793
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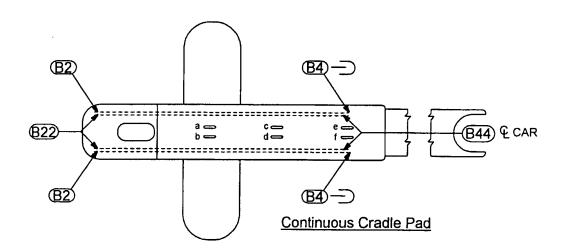
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 12B

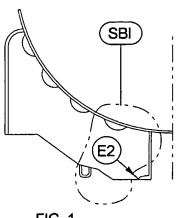




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Filing Date: September 29, 2000
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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## FIG. 12C



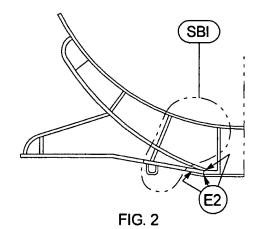
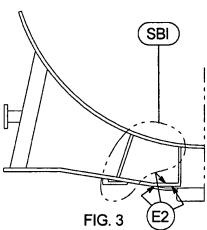
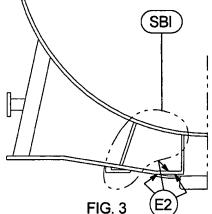
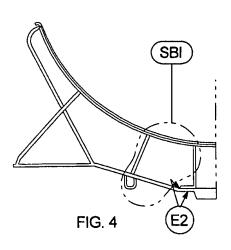
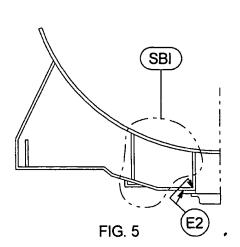


FIG. 1

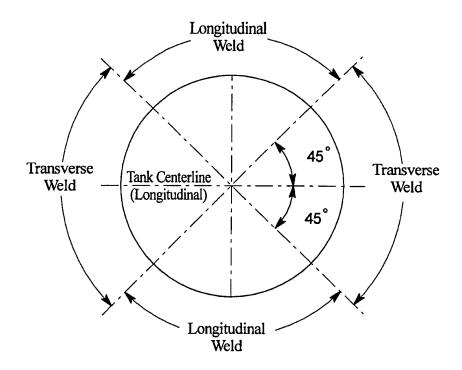




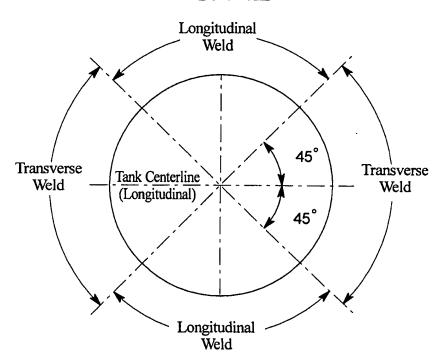




## FIG. 12D



#### FIG. 12E



REPLACEMENT SHEETS
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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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REPLACEMENT SHEETS Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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FIG. 12F

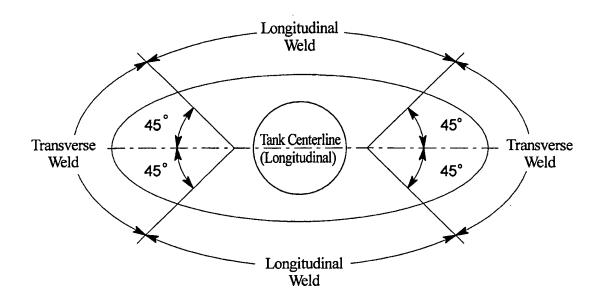
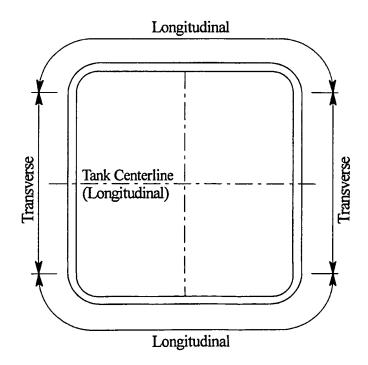


FIG. 12G



U.S. Patent Application No. 09/672,793

Title: Method and Arrangement for Inspection and Requalification of...

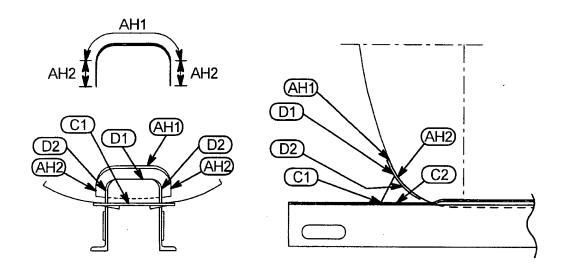
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 12H



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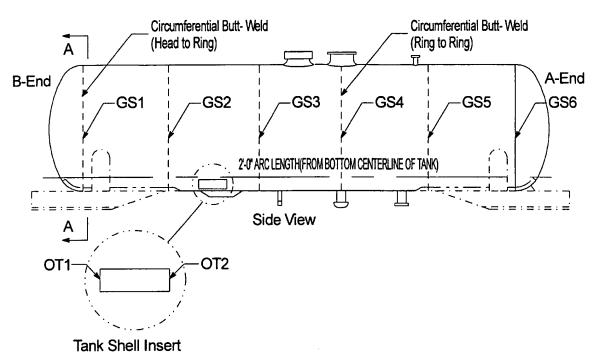
Title: Method and Arrangement for Inspection and Requalification of...

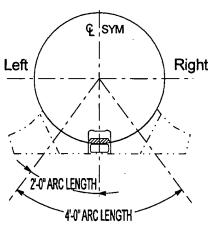
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 13A



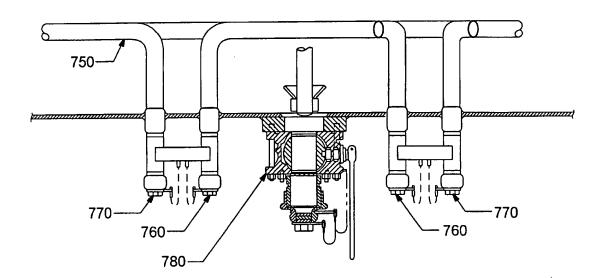


Section A-A (Looking Outboard from Inside of Tank)

REPLACEMENT SHEETS
Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
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#### FIG. 13B



Title: Method and Arrangement for Inspection and Requalification of...

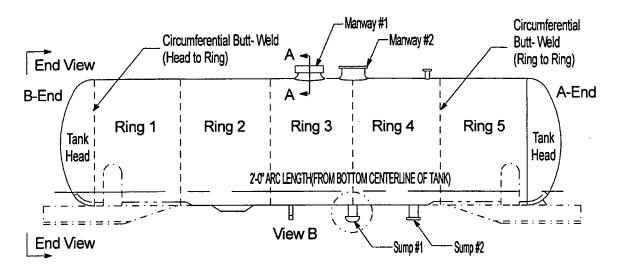
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

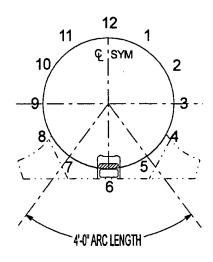
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#### FIG. 14A





REPLACEMENT SHEETS

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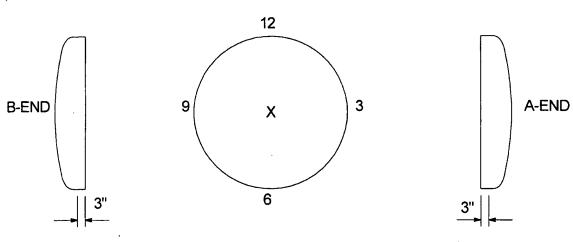
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

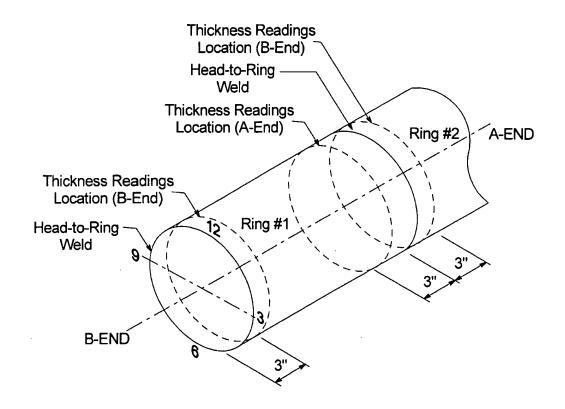
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#### FIG. 14B



**FIG. 14C** 



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#### FIG. 15A

#### ALLOWABLE SAFETY RELIEF VALVE PRESSURE TOLERANCES

| Nominal<br>STD <sup>1</sup><br>(psig) | Tolerance<br>(+/-) <sup>4</sup><br>(psig) | Minimum<br>STD <sup>1</sup><br>(psig) | Maximum<br>STD <sup>1</sup><br>(psig) | Minimum<br>VTP <sup>1</sup><br>(psig) | Gauge<br>Range <sup>5</sup><br>(psig) | Maximum<br>Gauge<br>Increment <sup>5</sup><br>(psig) |  |  |  |  |
|---------------------------------------|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--|--|--|--|--|
| 35                                    | 3   | 32                                    | 38                                    | 28                                    | 0-100                                 | 1  |  |  |  |  |
| 75                                    | 3   | 72                                    | 78                                    | 60                                    | 0-150/160                             | 1  |  |  |  |  |
| 150                                   | 4.5                                       | 145.5                                 | 154.5                                 | 120                                   | 0-300                                 | 2  |  |  |  |  |
| 225                                   | 6.75                                      | 218.25                                | 231.75                                | 180                                   | 0-400                                 | 5  |  |  |  |  |
| 247.5                                 | 7.4                                       | 240.1                                 | 254.9                                 | 196                                   | 0-400                                 | 5  |  |  |  |  |
| 255                                   | 7.7                                       | 247.3                                 | 262.7                                 | 204                                   | 0-400                                 | 5  |  |  |  |  |
| 280.5                                 | 8.4                                       | 272.1                                 | 288.9                                 | 224                                   | 0-500                                 | 5  |  |  |  |  |
| 300                                   | 9   | 291                                   | 309                                   | 240                                   | 0-500                                 | 5  |  |  |  |  |
| 330                                   | 10  | 320                                   | 340                                   | 264                                   | 0-500                                 | 5  |  |  |  |  |
| 375                                   | 11.25                                     | 363.75                                | 386.25                                | 300                                   | 0-600                                 | 10   |  |  |  |  |
| 450                                   | 13.5                                      | 436.5                                 | 463.5                                 | 360                                   | 0-750                                 | 10   |  |  |  |  |

#### NOTES:

- 1. STD indicates start-to-discharge.
- 2. VTP indicates vapor-tight pressure.
- 3. Valves should be set or reset to NOMINAL STD pressure.
- 4. DOT requirements for tolerance are given in 49CFR173.31(c)(6). Pressure tolerances listed above have been shown here to assist testing personnel and are not intended to alter any DOT requirements.
- 5. Digital or dial gauges of greater range may be used if accuracy and sensitivity levels are equal to or better than required above.

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#### FIG. 15B

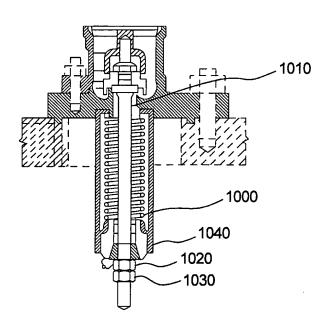
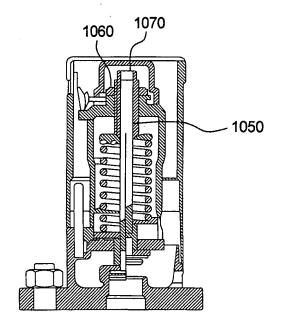


FIG. 15C

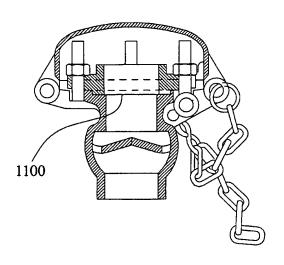


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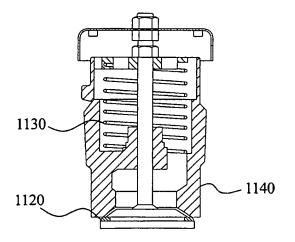
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#### FIG. 15D

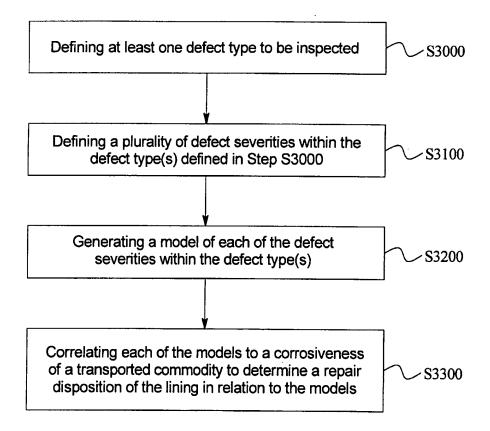


#### FIG. 15E



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#### FIG. 16



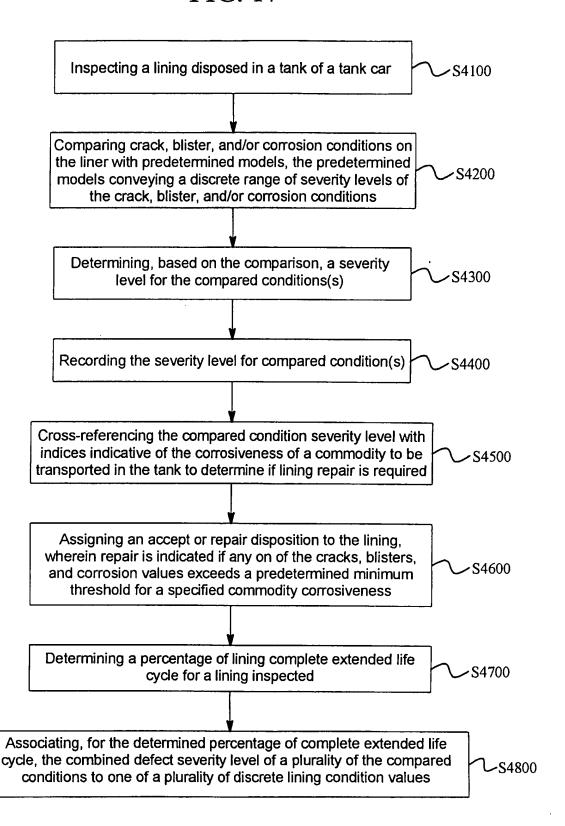
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
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#### FIG. 17



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FIG. 18A

AAR < ⋖ 4 Commodity Corrosiveness က AIAIAIAIAIAIA TABLE 1: Accept/Repair Disposition x|x|x|A|A|x|x|x|x|x3620 P.P. R R R R R R R R R R Condition RES ES 80480 4 0 Corrosion Defect **Blisters** Cacks 3610-

A = Accept as is disposition

R = Repair disposition

REPLACEMENT SHEETS

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Lining System Operating Characteristics

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# FIG. 18B

#### Estimated Life 7 years 8 years 8 years 7 years 8 years 12 years 7 years 6 years adhesion. Welds may deteriorate (corrosion) Oxidizing chemicals may attack the sheet (direct or reverse), temperature cycling or (direct or reverse), temperature cycling or Becomes brittle on aging. May blister in unsuitable chemicals. May crack under and/or soften in certain chemicals. May and/or soften in certain chemicals. May Becomes brittle with aging. May slightly Becomes slightly brittle with aging. May lining and embrittle. Sheets may loose blister and/or soften in certain solvents. Becomes brittle on aging. May blister Becomes brittle on aging. May blister vibration. Hydrogen grooving of steel under coating in highly concentrated Cracking due to mechanical impact Cracking due to mechanical impact Better Crack and Impact Resistant crack under impact and bending. crack under impact and bending. Fair Crack and Impact Resistant Failure Criteria soften in certain solvents. impact and bending. sulfuric acid. ibration. for most Solvents Maximum Temperature 150F Good Acid and Alkali Resistance Not suitable Hard rubber better resistant than soft rubber Can be used for Food Grade Chemicals Can be used for Food Grade Chemicals Very good resistance against hot alkalis Very good resistance against hot alkalis Good resistance against diluted alkalis Good resistance against strong Alkalis Diluted, non oxidizing Inorganic Acids Diluted, non oxidizing Inorganic Acids Diluted Organic and Inorganic Acids Very good resistance against Alkalis Diluted Organic and Inorganic Acids Recommended Service Resistant against most Solvents Resistant against some solvents Less suitable for strong Alkalis Can be Food Grade Compliant Organic and Inorganic Acids Acidity not lower than pH 2 Very good Alkali Resistance Resistant to most Solvents (concentrated and diluted) Good Solvent Resistance Good Solvent Resistance Good Solvent Resistance Good Solvent resistance Very good Water Resistance Very good Water Resistance Very good Water Resistance Good Corrosion Resistance High Temperature Resistant Good Corrosion Resistance Application using in-situ vulcanizing and adhesives Less brittle than unmodified Good Water Resistance Good Water Resistance Good Water Resistance Good Water Resistance Plural Component Appl. Difficult to repair or to Properties **Iwo-pack materials Iwo-pack materials** Two-pack materials Two-pack materials touch-up phenolics 10 - 14 mils 2 coats 8 to 10 mils 8 to 10 mils approx. dft in multiple in multiple in 2 coats in 2 coats 12 to 15 12 to 15 12 to 15 in 1 coat ≸ 12 to 15 coats E SIE Epoxy/Polyamidoamine Epoxy/Phenolic/Amine (Modified) High Bake Phenolic (400°F) Bake Phenolic (400°F) Epoxy/Amine Solvent Free. Air dry of force (Modified) High Bake Epoxy/Amine (400°F) (Modified) High Bake Epoxy//Amine (250°F) air-dry or force curing Rubber Sheet Lining Lining System (Unmodified) High Force curing Curing (\*)

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| 3700                             |                  |                        |            |               |            |          |             |            |               |            |          |             |            |                |            |          |             |            |               |            |          |             |            |               |            |          |             |
|----------------------------------|------------------|------------------------|------------|---------------|------------|----------|-------------|------------|---------------|------------|----------|-------------|------------|----------------|------------|----------|-------------|------------|---------------|------------|----------|-------------|------------|---------------|------------|----------|-------------|
|                                  |                  | Poor<br>D              | > No. 6    | > No. 6 (45%) | > Re 2     | <6 mils  | > 10 Sq. Ft | > No. 6    | > No. 2 (15%) | < Re 2     | < 6 mils | > 20 Sq. Ft | > No. 4    | > No. 4 (15%)  | < Re 2     | < 5 mils | > 20 Sq. Ft | > No. 4    | > No. 2 (45%) | < Re 2     | < 5 mils | > 20 Sq. Ft | > No. 4    | > No. 4 (15%) | < Re 3     | < 5 mils | > 20 Sq. Ft |
| n Matrix                         |                  | Fair<br>C              | > No. 8    | > No. 6 (15%) | > Re 1     | > 6 mils | < 10 Sq. Ft | > No. 8    | > No. 4 (45%) | < Re 2     | > 6 mils | < 20 Sq. Ft | > No. 8    | > No. 4 (15%)  | < Re 2     | < 5 mils | < 20 Sq. Ft | > No. 6    | (15%)         |            | > 5 mils | < 20 Sq. Ft | > No. 4    | (15%)         | < Re 2     | > 5 mils | < 20 Sq. Ft |
| TABLE 2: Lining Condition Matrix | Lining Condition | Good<br>B              | ı          | 8             | No Defects | > 7 mils | No Spots    | No Defects | > No. 6 (15%) | No Defects | > 7 mils | No Spots    | No Defects | > No. 6 (15%)  | No Defects | > 5 mils | < 10 Sq. Ft | No Defects | > No. 4 (15%) | No Defects | > 5 mils | < 10 Sq. Ft | No Defects | > No. 4 (15%) | cts        | > 5 mils | < 10 Sq. Ft |
| TABLE 2                          |                  | Excellent A            | No Defects | No Defects    | No Defects | > 8 mils | No Spots    | No Defects | No. 6 (2.5%)  | No Defects | > 7 mils | No Spots    | No Defects | > No. 6 (2.5%) | No Defects | > 6 mils | No Spots    | No Defects | No. 6 (15%)   | No Defects | > 5 mils | < 10 Sq. Ft | No Defects | > No. 4 (15%) | No Defects | > 5 mils | < 10 Sq. Ft |
|                                  | Defect           | Туре                   | Crack      | Blister       | Corrosion  | - L      | Stains      | Crack      | Blister       | Corrosion  | 머        | Stains      | Crack      | Blister        | Corrosion  | 머        | Stains      | Crack      | Blister       | Corrosion  | 님        | Stains      | Crack      | Blister       | Corrosion  | H        | Stains      |
|                                  | Complete         | Extended<br>Life Cycle | 0 - 25%    |               |            |          |             | 26 - 42%   |               |            |          |             | 43 - 58%   |                |            |          |             | 59 - 83%   |               |            |          |             | > 83%      |               |            |          |             |

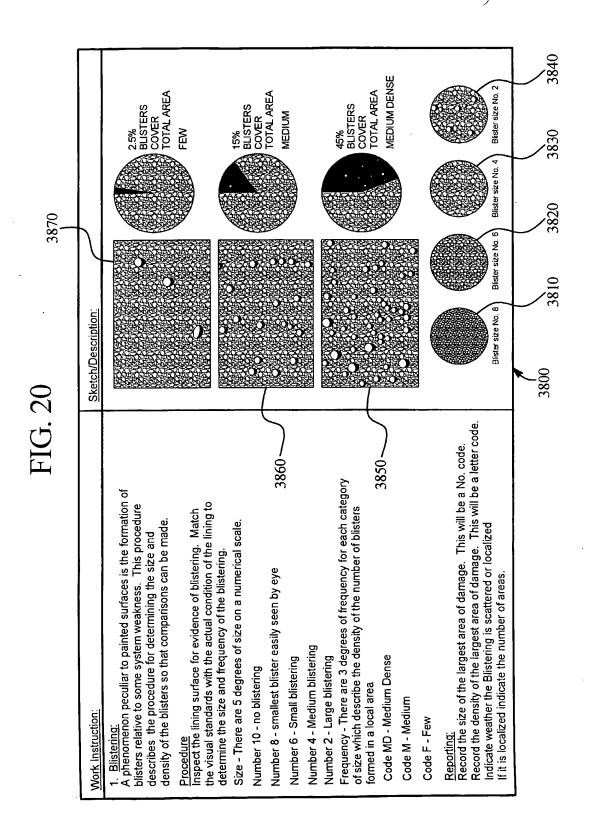
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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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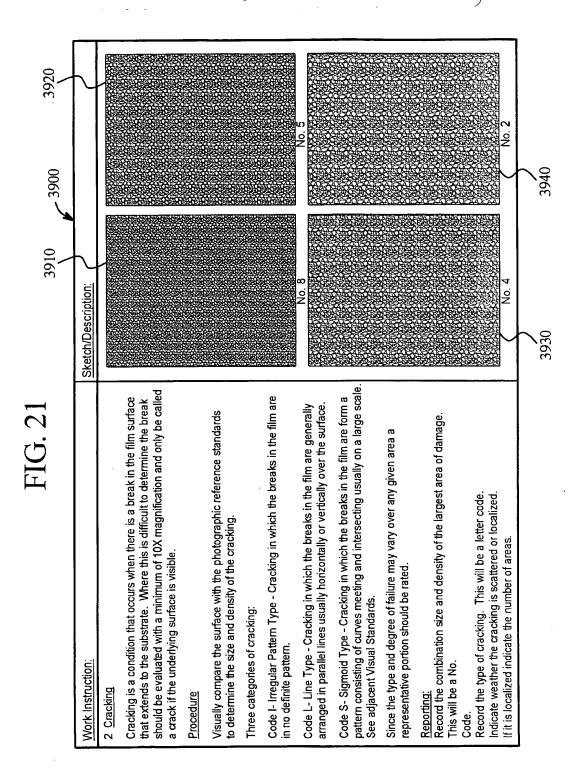


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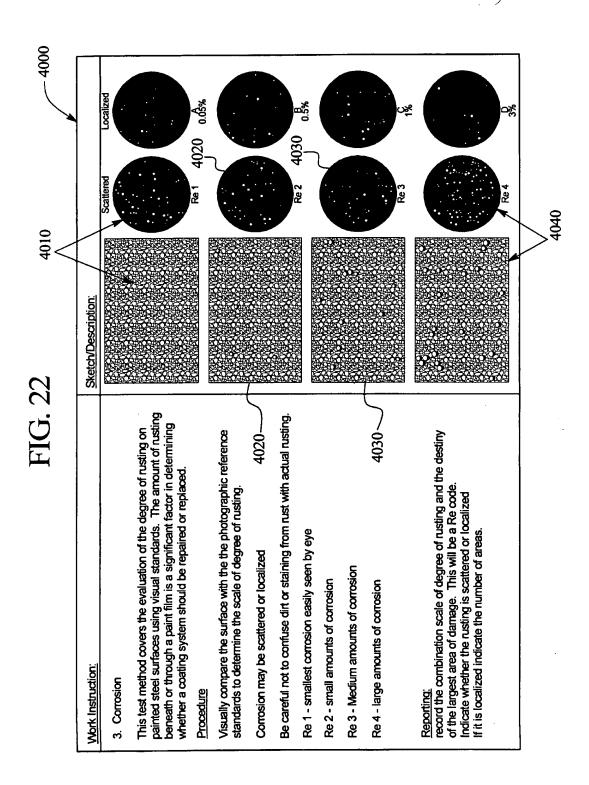
Title: Method and Arrangement for Inspection and Requalification of...

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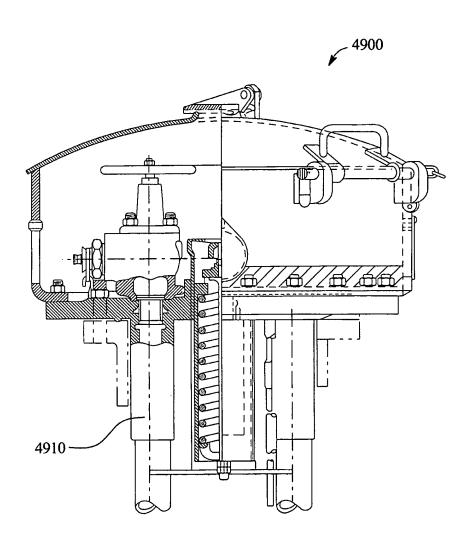
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### FIG. 23



REPLACEMENT SHEETS

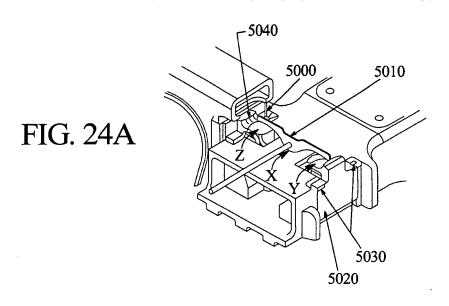
Filing Date: September 29, 2000 U.S. Patent Application No. 09/672,793

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**FIG. 24B** 

| Type of Truck   | Repair When Total Clearance Between Bolster and Truck Side Frame Columns Reaches: |                          | Repair to These Nominal<br>Clearance Dimensions<br>Between Bolster and<br>Truck Side Frame: |                  |                       |
|---|---|--------------------------|---|------------------|-----------------------|
|   | Lateral (inches)  | Longitudinal<br>(inches) | Lateral   |                  | Total                 |
|   |   |                          | Inside<br>(inches)  | Outside (inches) | Longitudinal (inches) |
| Trucks WTH built-in snubbing features having roller bearings which provide lateral (all bearing sizes): or having 5" x 9" or 5 1/2" x 10" roller bearings which provide no bearing lateral. | 1 1/8"  | *                        | 1/4"  | 1/4"             | *                     |
| Trucks with built-in snubbing features having 6" x 11", 6 1/2 x 12" or 7" x 12" roller bearings which provide no bearing lateral.   | 1 1/2"  | *                        | 1/2"**  | 1/2"**           | *                     |

<sup>\*</sup> Longitudinal clearances are primarily a matter of wear of frame or bolster column wear plates, friction shoes and bolster or frame column surfaces. See maintenance instructions from truck designer of manufacturer.

<sup>\*\* 1/4&</sup>quot; and 5/8" clearances are acceptable on bolster manufactured prior to 1987.

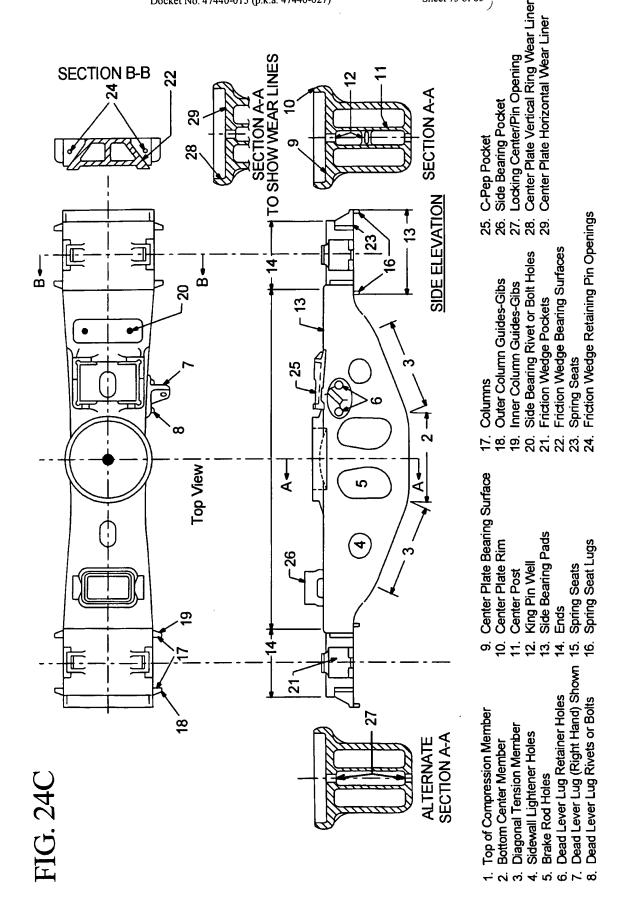
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)

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### FIG. 24D

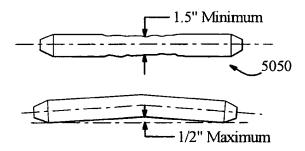


FIG. 24E

| Bettendorf   | <u>Buckeye</u> | <u>ASF</u>             | Pittsburgh Steel  | Scullin Steel 4665   5364   5869-B   |  |   |
|--|----------------|------------------------|---|--|--|---|
| UT456  | 3-1776         | 7273                   | Foundry   |  |  |   |
| Dresser TF5105 Dominion TF-5100 Canadian Steel Foundry 26565 | F-420<br>F-535 | 7323<br>21182<br>21362 | 3-1673<br>3-1674<br>4-1862<br>4-2045<br>12897<br>12921<br>21263 | 4770<br>4891<br>4942<br>5171<br>5220<br>5321-A<br>5321-B<br>5321-C<br>5321-F<br>5321-H | 5364-C<br>5364-E<br>5413-B<br>5483-A<br>5483-B<br>5600-A<br>5600-B<br>5600-C<br>5811-A<br>5869-A | 5917-A<br>6260-C<br>6260-D<br>6428-A<br>6577-A<br>6656<br>6673-A<br>7207<br>42-CS-180 |

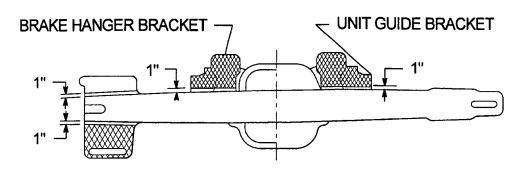
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

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#### FIG. 24F



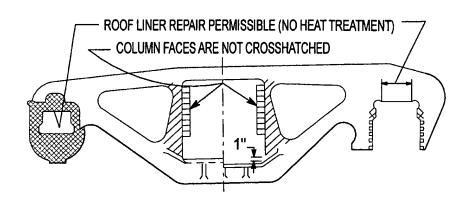
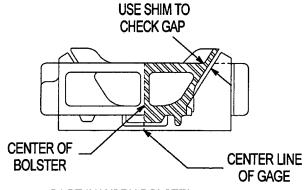
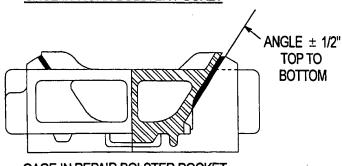


FIG. 24G



**GAGE IN WORN BOLSTER POCKET** 



GAGE IN REPAIR BOLSTER POCKET

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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

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### FIG. 24H

| AAR<br>Designation | Load Carrying Spring<br>Condemning Free<br>Height |
|--------------------|---|
| D3                 | 8 5/8"  |
| D4                 | 9 1/16"   |
| D5                 | 9 5/8"  |
| D6                 | 9 5/16"   |
| D6A                | 8 3/8"  |
| D7                 | 10"   |

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FIG. 25A

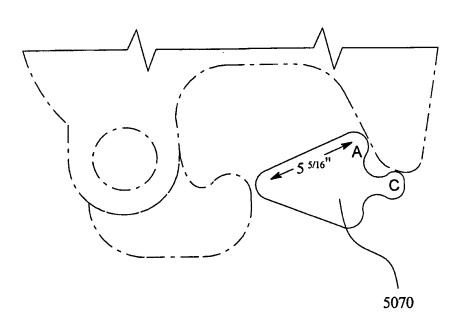
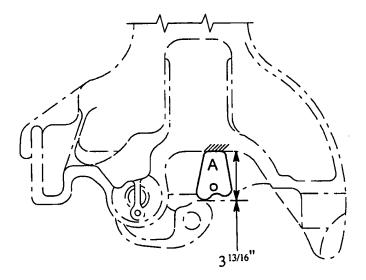
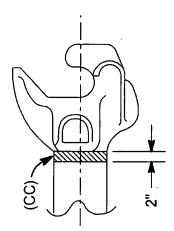


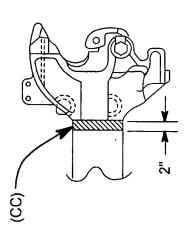
FIG. 25B

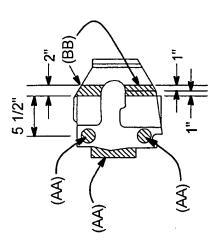


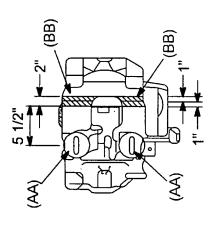
REPLACEMENT SHEETS
Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
Docket No. 47440-015 (p.k.a. 47440-027) Sheet 80 c

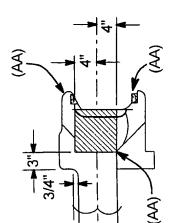
Sheet 80 of 85











Title: Method and Arrangement for Inspection and Requalification of...

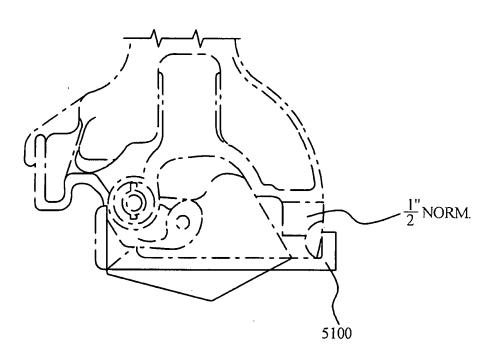
Patent Agent: Patrick D. Richards (Reg. No. 48,905)

Tel: 312.372.2000 Fax: 312.984.7700

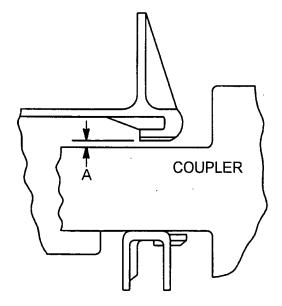
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# FIG. 25D



## FIG. 25E



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Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
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FIG. 25F

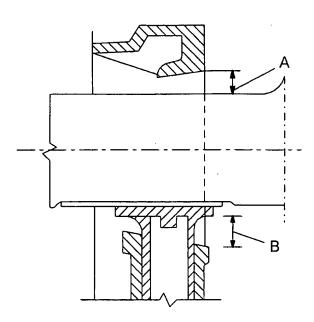


FIG. 25G

| Coupler Type                       | Striker | Min. Clearance<br>Spring Basket Top to<br>Underside of Carrier Lip.<br>Dimension "B"<br>(inches) |
|------------------------------------|---------|--|
| F70,F71,F72,SF70<br>29 1/4" Length | 1 1/8"  | 1 5/8"   |
| F79,SF79<br>43" Length             | 2 3/8"  | 3 1/2"   |

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Filing Date: September 29, 2000
U.S. Patent Application No. 09/672,793
Title: Method and Arrangement for Inspection and Requalification of...
Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700
Docket No. 47440-015 (p.k.a. 47440-027) Sheet 83 center of the second of th

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### FIG. 25H

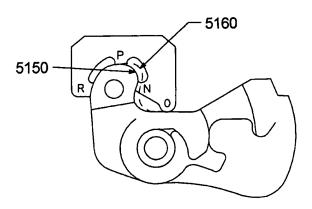
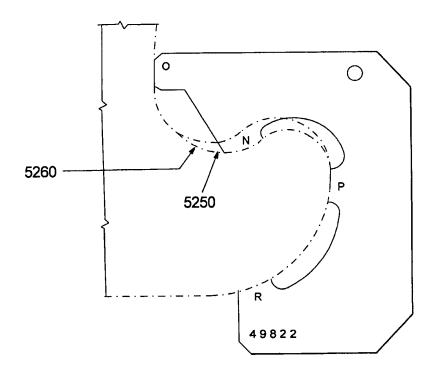


FIG. 25 I



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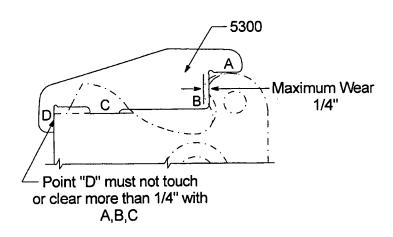
Title: Method and Arrangement for Inspection and Requalification of...

Patent Agent: Patrick D. Richards (Reg. No. 48,905)
Tel: 312.372.2000 Fax: 312.984.7700

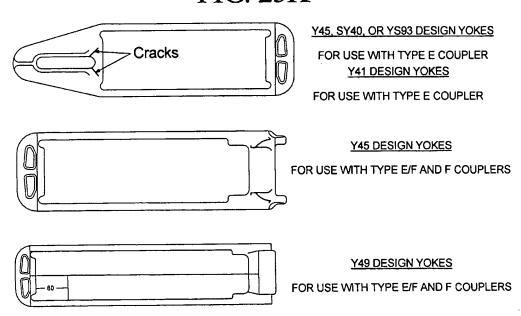
Docket No. 47440-015 (p.k.a. 47440-027)

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### FIG. 25J



#### FIG. 25K



REPLACEMENT SHEETS Filing Date: September 29, 2000

U.S. Patent Application No. 09/672,793

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Patent Agent: Patrick D. Richards (Reg. No. 48,905)

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### FIG. 26a

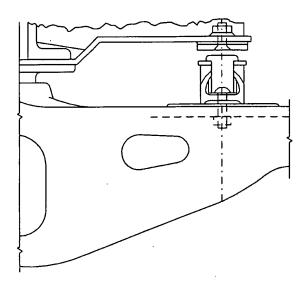


FIG. 26b

